

STS-112
FLIGHT READINESS REVIEW

September 17, 2002

Ground Operations

AGENDA	

- Shuttle Processing

- Integrated Operations

J. Vevera

- Shuttle Engineering

G. Crews

- Launch and Landing

M. Leinbach

- Summary

D. King

A. Allen

C. Murphy

PROCESSING DIFFERENCES

Presenter:

Jim Vevera

Organization/Date:

Ground Ops/09-17-02

Processing Differences - VAB / Pad

- Planned
 - APU Gearbox Repress
 - ET Ascent Camera Checkout

- Unplanned
 - MPM Overcenter MR Installation

SHUTTLE ENGINEERING OVERVIEW	Presenter: Greg Crews
	Organization/Date: Ground Ops/09-17-02

The following Topics have been reviewed:

- | | |
|--------------------------------------------|-----------------|
| ● Requirements Status – OMRS | No Issues |
| ● TOPS Status | No Issues |
| ● Software, SCAN, and Configuration Status | No Issues |
| ● Vehicle/GSE Modification Status | No Issues |
| ● In-Flight Anomaly Status | Back Up |
| ● Lost Item Problem Reports | To Be Presented |
| ● Time/Life Cycle | No Issues |
| ● Critical Process Changes | No Issues |
| ● Unexplained Anomalies | Back Up |
| ● Safety, Quality, and Mission Assurance | No Issues |
| ● Engineering Topic | No Issues |
| ● Nonstandard Work Summary | No Issues |

ENGINEERING TOPIC LOST WIRE CUTTER TOOL	Presenter: Greg Crews
	Organization/Date: Ground Ops/09-17-02

- Observation
 - On 5/29/02, a 3/8" True Flush Wire Cutter was identified missing after completion of an OEL task in the Aft Compartment of OV-104 from a Serialized Tool Box
- Concerns
 - Sharp edges and mass of this tool may cause damage to orbiter systems and components in the aft compartment

**ENGINEERING TOPIC
LOST WIRE CUTTER TOOL**

Presenter:

Greg Crews

Organization/Date:

Ground Ops/09-17-02



GO-7

ENGINEERING TOPIC LOST WIRE CUTTER TOOL

Presenter:

Greg Crews

Organization/Date:

Ground Ops/09-17-02

- Discussion
 - The wire cutting tool was lost from A015-117 Tool Box
 - Mfg. P/N E709AWC6-CT
 - Tool Length - 4.3 inches
 - Tool Weight – 57.7 grams
 - A tool bag, and the entire Tool Box was logged IN/OUT of the vehicle by the Orbiter Integrity Clerk (OIC) on 5/29/02
 - Tool was originally used in Av Bay 4 for LCA-1/PCA-4 Connector rework by one technician
 - Tool was then placed back into tool bag while supporting another tech in Av Bay 6 area for the LCA-3 removal effort

ENGINEERING TOPIC LOST WIRE CUTTER TOOL

Presenter:

Greg Crews

Organization/Date:

Ground Ops/09-17-02

- Discussion (Cont'd)
 - After completion of work in the ship:
 - Electrical Technicians cleaned up both work areas of empty baggies, lumalloy, parts tags, and elephant hide (padding) and placed the debris into their work bags
 - Took the tool bags/debris to Aft Shop area to finish paperwork
 - Later discovered that the debris had been thrown away by a different employee, leaving only tools in the tool bag
 - Near the end of shift, during the return of tools to the shadow tool box, the wire cutters were first identified as missing
 - An immediate search for the tool was started

**ENGINEERING TOPIC
LOST WIRE CUTTER TOOL****Presenter:****Greg Crews****Organization/Date:****Ground Ops/09-17-02**

- **Actions Taken**
 - Technicians then returned to the aft:
 - Spent 45 minutes searching in the areas worked for the wire cutters
 - Also, searched the Aft exit route from the work locations
 - Searched several trash cans looking for the debris and tool
 - Recorded this item in the Lost and Found TAIR Record for OV-104 and documented this situation on PR LAF-4-26-0534

ENGINEERING TOPIC LOST WIRE CUTTER TOOL

Presenter:

Greg Crews

Organization/Date:

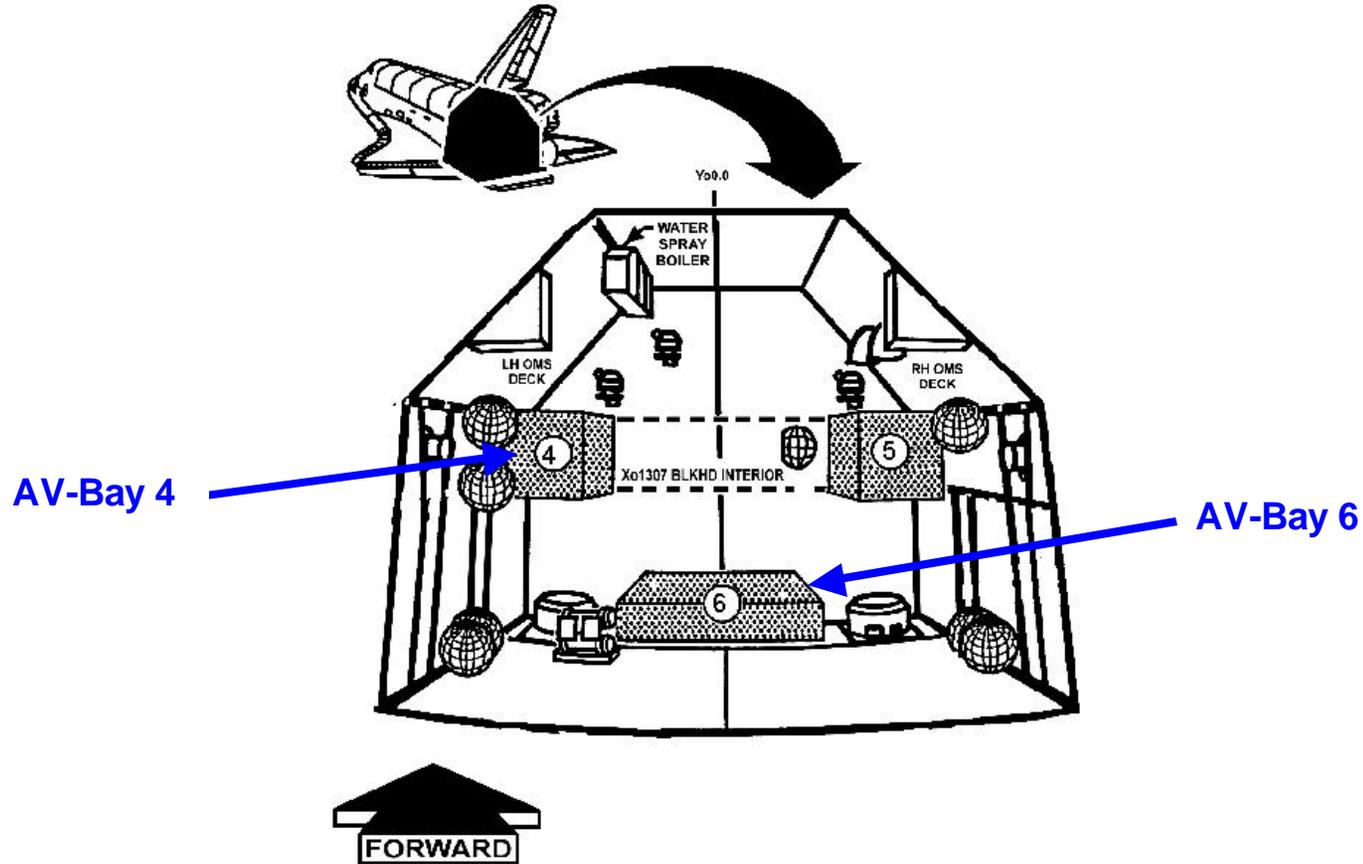
Ground Ops/09-17-02

- Actions Taken (Cont'd)
 - Additional Horizontal Aft Searching Efforts:
 - On the next day, technician and his lead, searched the aft work area and the tool exit path for 4 hours
 - A total of over 24 tech-hours have been spent by various personnel searching for the wire cutters
 - All Aft shop personnel briefed at workmanship meetings to be looking for this tool and it has not been found to date (approximately 3 months processing time)
 - Additional Vertical Aft Search Efforts:
 - Have performed additional searching in the vehicle Aft after rotation to the vertical, both in the VAB and at the PAD (will continue thru Aft closeout) – 19 hours to date
 - Av-bay panels were removed for vertical search of bays (Av-bays 4 & 6) where work was being performed
 - Tool was not found

ENGINEERING TOPIC LOST WIRE CUTTER TOOL

Presenter:
Greg Crews

Organization/Date:
Ground Ops/09-17-02



ENGINEERING TOPIC LOST WIRE CUTTER TOOL	Presenter: Greg Crews
	Organization/Date: Ground Ops/09-17-02

- Mitigating Factors
 - This tool is large and has Bright Red Rubber coated handles (visible)
 - Shop often finds lost APEX tips, washers, and many other much smaller items, supporting the conclusion this tool is not lost inside the ship
- Flight Rationale
 - Unacceptable to fly with this tool in the Aft
 - Over 3 months of Aft operations have not found the “RED HANDLED” large tool in the ship
 - Tool is believed to have been thrown out with the cleaned up debris
 - Based on the results of extensive searches, the tool is not in the Aft of OV-104

**ENGINEERING TOPIC
LOST WIRE CUTTER TOOL****Presenter:****Greg Crews****Organization/Date:****Ground Ops/09-17-02**

- Follow-up Corrective Actions Planned
 - Process enhancements to identify lost tools at vehicle egress
 - Technician will log tool quantity at vehicle ingress/egress with Orbiter Integrity Clerk (OIC) for the OPF process
 - High volume traffic solution
 - Individual tools are presently logged in/out for PAD process
 - Less traffic and more diverse work environment
 - OIC's will conduct random audits of serialized tool boxes

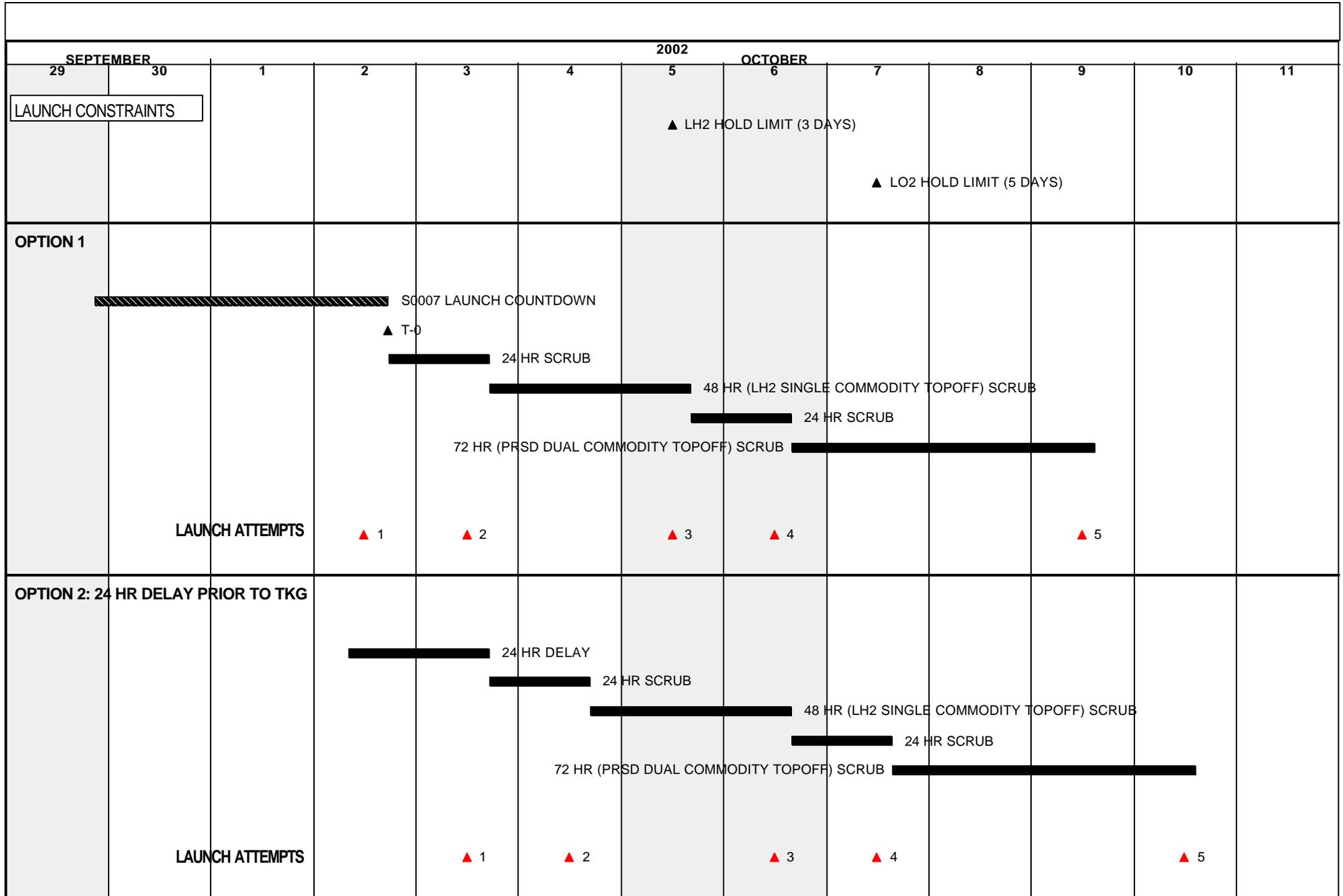
NOTE:
Actual scrub turnaround timelines will be determined
realtime based on specific conditions encountered.

STS-112

LAUNCH COUNTDOWN TURNAROUND OPTIONS

OPR: J. Spaulding 1-9306

06SEP02 11:08



LANDING OPERATIONS STATUS

Presenter:

Mike Leinbach

Organization/Date:

Launch & Landing/09-17-02

- Launch Support
 - ❖ **RTLS:** KSC
 - ❖ **TAL:**
 - Zaragoza (Prime) Deploy at L-7 days, Sep 25, 2002
 - Moron (Alt) Deploy at L-7 days, Sep 25, 2002
 - ❖ **AOA:**
 - KSC (Prime) Deploy at L-4 days, Sep 29, 2002
 - WSSH (Alt)

- Mission Support
 - ❖ KSC (Prime EOM)
 - ❖ DFRC/EDW Deploy at L-2 days, Oct 1, 2002

- Site Status
 - ❖ Ben Guerir will not be utilized for STS-112



Crawler Transporter (CT) Jacking Cylinder Bearing Failure Summary

Mike Leinbach

09-17-02



Crawler Transporter Jacking Cylinder Bearing Failure Recovery Plan

Presenter:

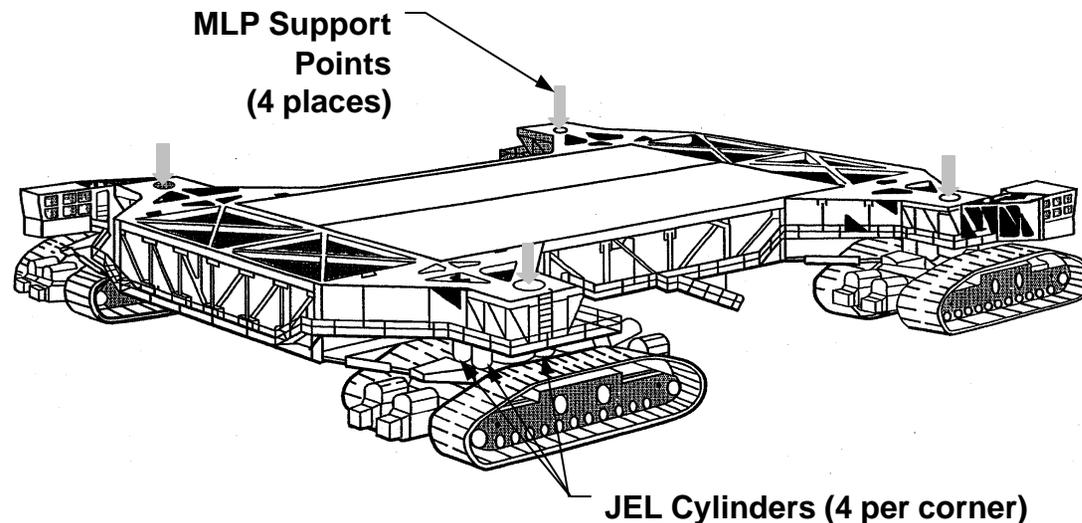
Mike Leinbach

Organization/Date:

Launch & Landing / 09-17-02

Observation

- Two JEL (Jacking, Equalization, and Leveling) Cylinders were removed from CT-2 as the beginning of a planned refurbishment program
 - Disassembly revealed that three of the four spherical bearings were severely cracked
- **Inspection of all 32 cylinders showed 30 of 64 bearings were cracked or broken**

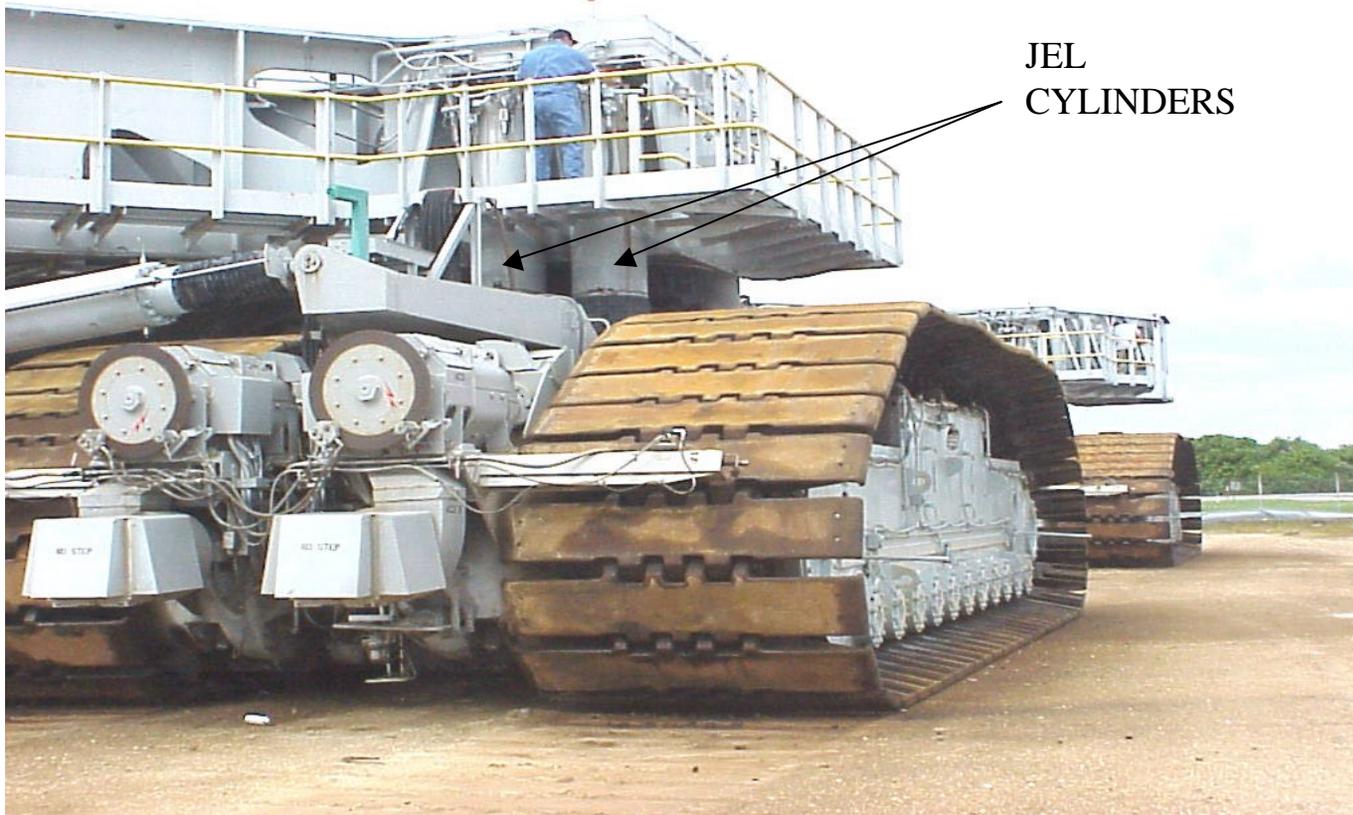


Crawler Transporter Jacking Cylinder Bearing Failure Recovery Plan

Presenter:
Mike Leinbach

Organization/Date:
Launch & Landing / 09-17-02

CT JEL Cylinder Locations



Crawler Transporter Jacking Cylinder Bearing Failure Recovery Plan

Presenter:
Mike Leinbach

Organization/Date:
Launch & Landing / 09-17-02

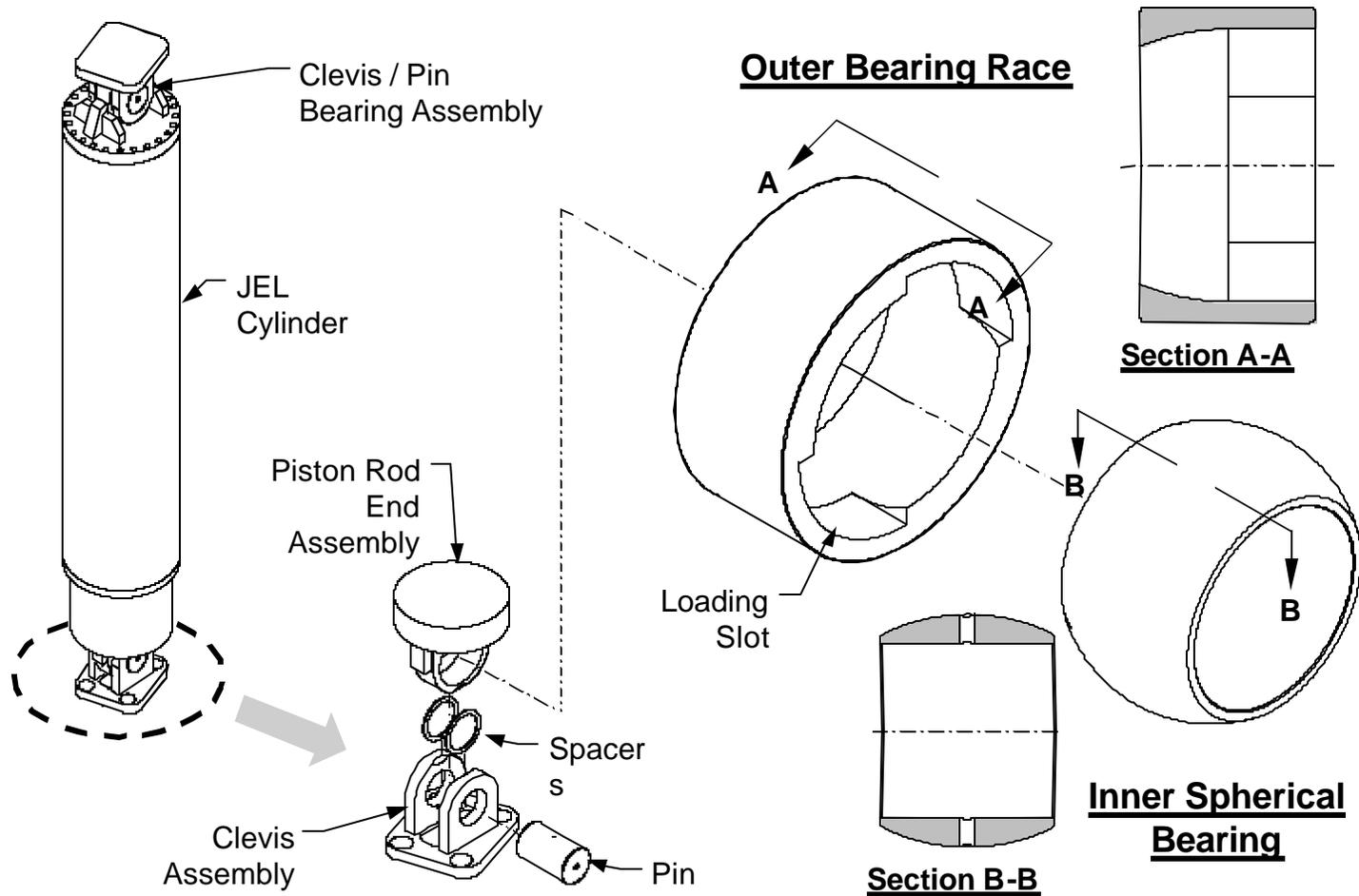
JEL Cylinder Removal



Crawler Transporter Jacking Cylinder Bearing Failure Recovery Plan

Presenter:
Mike Leinbach

Organization/Date:
Launch & Landing / 09-17-02



Crawler Transporter Jacking Cylinder Bearing Failure Recovery Plan

Presenter:

Mike Leinbach

Organization/Date:

Launch & Landing / 09-17-02

Background

- The spherical bearings on each end of the JEL cylinders are in the primary load path
- Each JEL cylinder weighs approximately 10,000 pounds, and can produce 1.6 million pounds of thrust
- All 32 cylinders (16 on each crawler) are originally-installed equipment that have been in service for 37 years
- Routine preventive maintenance (lubrication, corrosion control, etc.) has been performed over the service life per specification



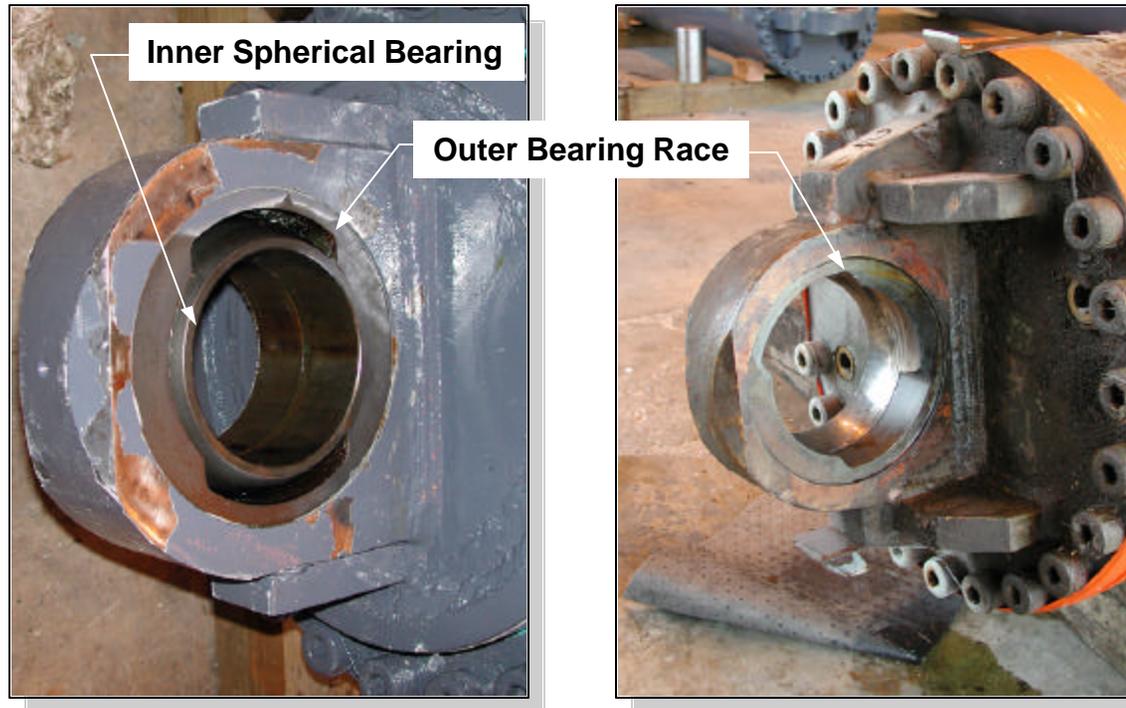
Crawler Transporter Jacking Cylinder Bearing Failure Recovery Plan

Presenter:
Mike Leinbach

Organization/Date:
Launch & Landing / 09-17-02

Failure Analysis

- Loss of lubrication in bearing load path caused outer race to rotate



- Bearing failed due to overload configuration

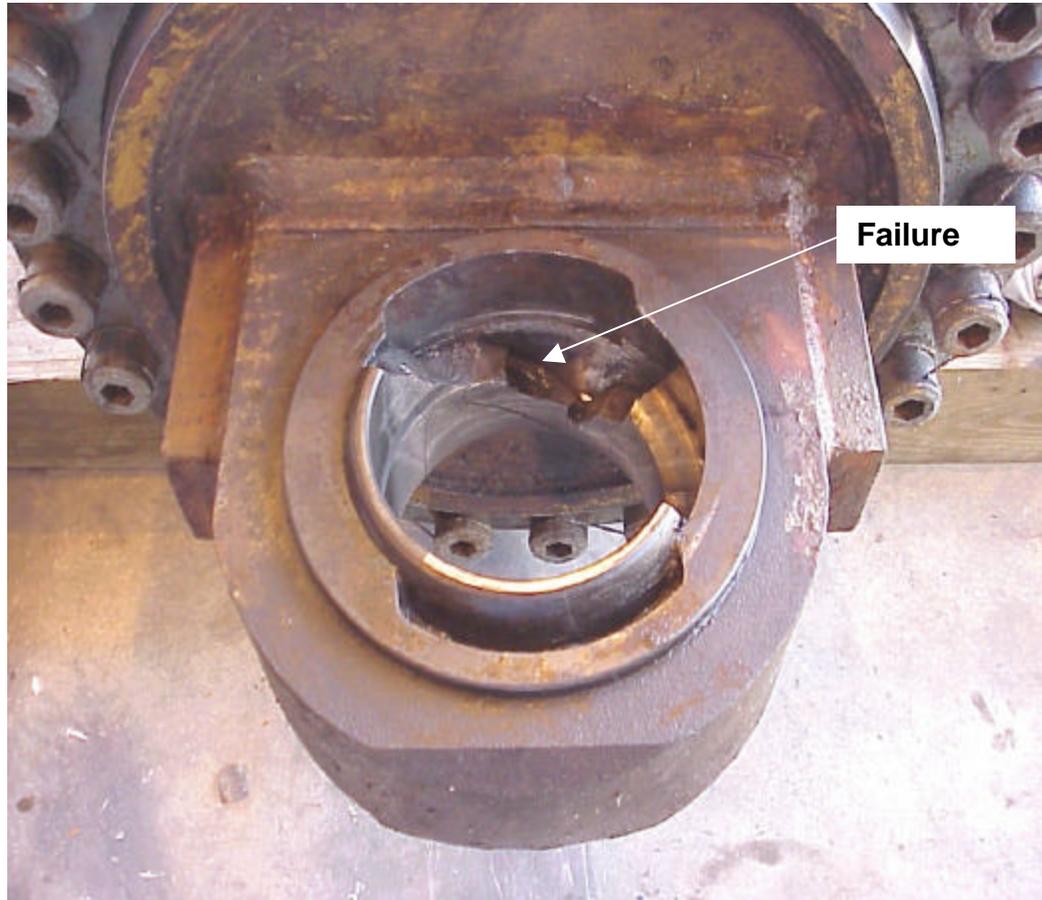


Crawler Transporter Jacking Cylinder Bearing Failure Recovery Plan

Presenter:
Mike Leinbach

Organization/Date:
Launch & Landing / 09-17-02

Bearing Failure



Crawler Transporter Jacking Cylinder Bearing Failure Recovery Plan

Presenter:

Mike Leinbach

Organization/Date:

Launch & Landing / 09-17-02

Corrective Action

- Current design determined to meet load requirements
- New and undamaged bearings installed with enhancements
 - New lubricant utilized with superior properties for application (Caterpillar Desert Gold Grease)
 - Method developed to mitigate rotation and augment press fit using Loctite 660, Quick Metal
- Repair meets original Crawler Transporter design and cycle life
 - Allows ample time for Design to evaluate modern bearing designs for possible upgrade (2020 support)
- CT-1 repair is In-work – ECD 11/02
 - Available for emergency use within 48 hours
- CT-2 Repaired, supported STS-112 roll to Pad and is Operational





Kennedy Space Center Shuttle Processing Team



STS-112 Readiness Statement

This is to certify that appropriate CoFR items from NSTS-08117 Appendices H and Q, Flight Preparation Process Plan, have been reviewed and dispositioned. Subject to completion of planned work and resolution of any identified constraints, KSC Shuttle Processing and Supporting Organizations are ready to support Launch Operations.

S/Charlie W. Murphy

Charlie W. Murphy
APM, Integrated Logistics,
USA.

S/Andrew A. Allen

Andrew A. Allen
APM, Ground Operations,
USA.

S/David A. King

David A. King
Director of Shuttle Processing,
NASA



STS-112
FLIGHT READINESS REVIEW

SEPTEMBER 17, 2002

Ground Operations
Back-Up Charts

GO-BU-1

GROUND LAUNCH SEQUENCER

Presenter:

Greg Crews

Organization/Date:

Ground Ops/09-17-02

Ground Launch Sequencer Configuration for STS-112

- GLSDD (KLO-82-0071A) Rev 9, Change C, August 2002
- GLS Software changes incorporated for this mission
 - None
 - See Back-Up Charts for standard Masks/Bypass

GROUND LAUNCH SEQUENCER

Presenter:

Greg Crews

Organization/Date:

Ground Ops/09-17-02

Ground Launch Sequencer Configuration for STS- 112

- GLSDD (KLO-82-0071A) Rev 9, Change C, August 2002

SSID / OMRS	Description and Remarks
• Mask	
ECL-40	FCL 1 & 2 Payload Heat Exchanger Flow Rate
PAY-02	Payload Auxiliary RPC A/B – On
PAY-03	Payload Aft Main B/C Power – On
DPS-23	LH DDU Good/ RH DDU Good

GROUND LAUNCH SEQUENCER	Presenter: Greg Crews
	Organization/Date: Ground Ops/09-17-02

● Ground Launch Sequencer Configuration for STS- 112

SSID/ OMRS	Description and Remarks
● Bypass	
INS-02	RCDR OPS2 BITE/Head Temp/Tape Motion
SSME-02	ME-1/2/3 MFV Downstream Temps #1&2
None	Photo Camera Sequencer Start no longer required
None	Bypass the setting of the GCU 1 Sel ind
None	GCDKTIM4E - Timer #4. This Timer was used to countdown the last 31 sec of the count NTD's no longer require use of of this timer

LOST ITEM PROBLEM REPORTS

Presenter:

Greg Crews

Organization/Date:

Ground Ops/09-17-02

Lost Items Not Found – 4 Total

Summary/Conclusion for all LAF PR's

- A thorough search of each area was unsuccessful in finding/retrieving the lost items
- System Engineering evaluations have concluded no adverse effect on Orbiter system operations

LOST ITEM PROBLEM REPORTS**Presenter:****Greg Crews****Organization/Date:****Ground Ops/09-17-02****AFT**

- LAF-4-26-0534 3/8" True flush wire cutter 4 7/16" long was detected missing after use during OEL-4-26-3098. Cutter belongs to Tool Box A015-117
 - Weight: 57.7 grams
 - Size: 4.3 in. long
 - Location: AFT Compartment (Search and Analysis Pending)
- LAF-4-26-0537 WSB wire clamps are missing a screw (NAS1100E3-10). Detected during V63-50018
 - Weight: 1 gram
 - Size: 0.75 in. long
 - Location: AFT Compartment

LOST ITEM PROBLEM REPORTS**Presenter:****Greg Crews****Organization/Date:****Ground Ops/09-17-02****AFT (CONT'D)**

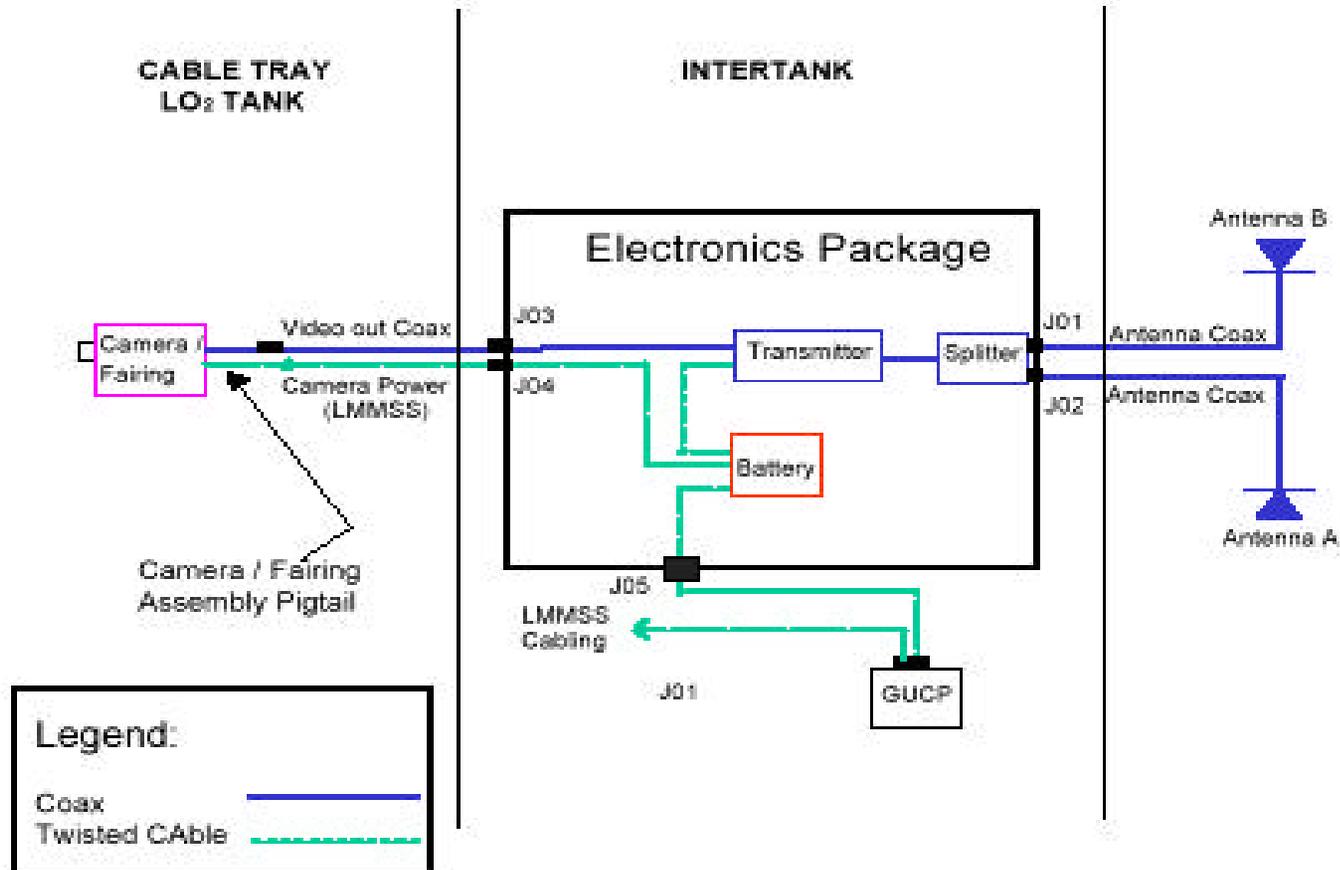
- LAF-4-26-0537 WSB wire clamps are missing 2 washers (MS15795-808). Detected during V63-50018
 - Weight: 0.5 grams
 - Size: 0.25 in. OD
 - Location: AFT Compartment

- LAF-4-26-0537 WSB wire clamps are missing a nut. (MS21043-3). Detected during V63-50018
 - Weight: 0.5 grams
 - Size: 0.5 in. OD
 - Location: AFT Compartment

ENGINEERING TOPIC ET-MOUNTED CAMERA MOD

Presenter:
Greg Crews

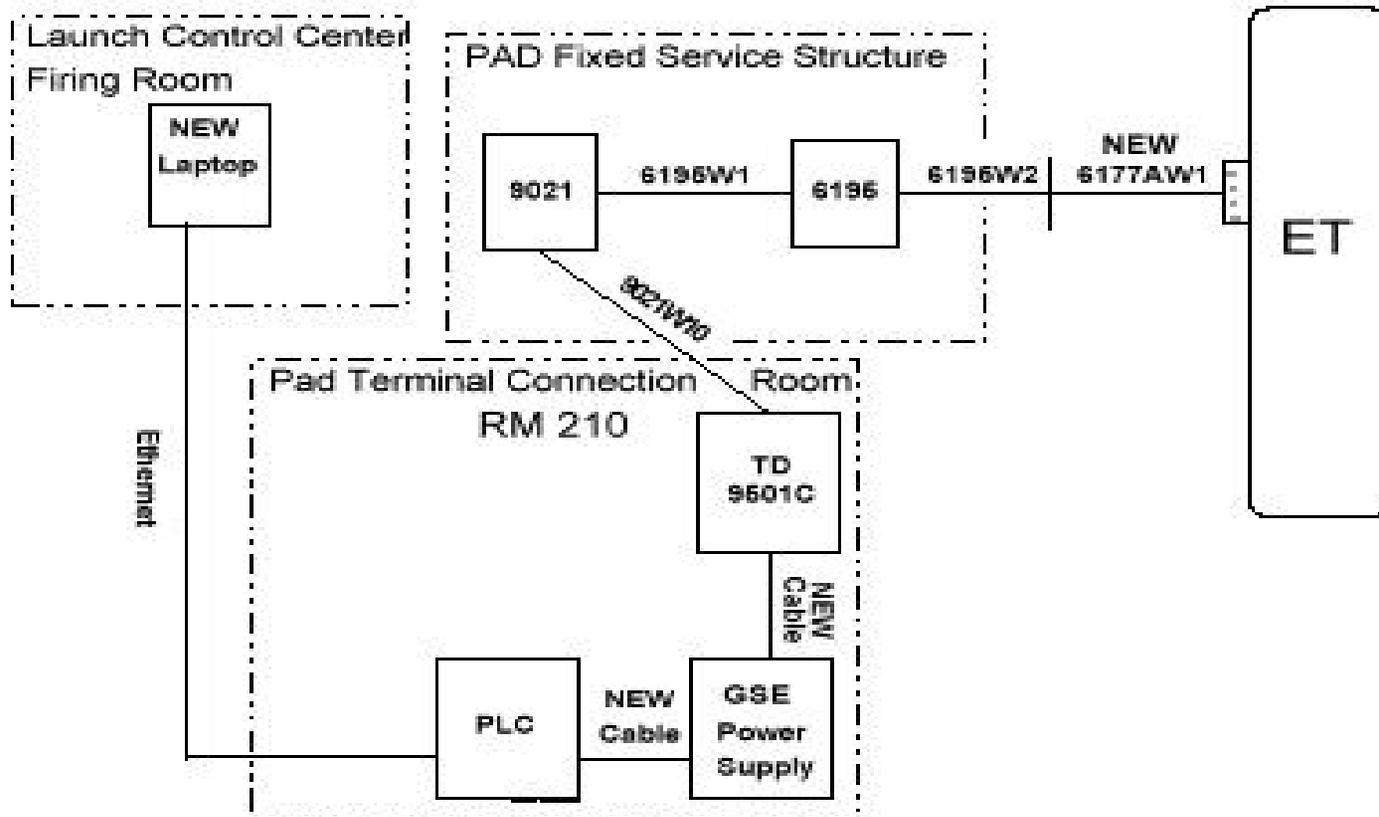
Organization/Date:
Ground Ops/09-17-02



ENGINEERING TOPIC ET-MOUNTED CAMERA MOD

Presenter:
Greg Crews

Organization/Date:
Ground Ops/09-17-02



**UNEXPLAINED ANOMALY
UNCOMMANDED SWITCHOVER
FROM LDB1 to LDB2****Presenter:****Greg Crews****Organization/Date:****Ground Ops/09-17-02**

- Observation
 - During STS-110 Launch Scrub Turnaround on 4/4/02 an uncommanded auto-switch from LDB-1 to LDB-2 occurred
 - After the completion of hazardous safing operations an attempt to switch back to LDB-1 also failed, indicating problem was still present
 - STS-112 is using the same MLP 3 as STS-110
- Concerns
 - Loss of Ground Polling capability to the vehicle could result in increased hazards and the inability to command the vehicle should both LDB paths fail at the same time

**UNEXPLAINED ANOMALY
UNCOMMANDED SWITCHOVER
FROM LDB1 to LDB2****Presenter:****Greg Crews****Organization/Date:****Ground Ops/09-17-02**

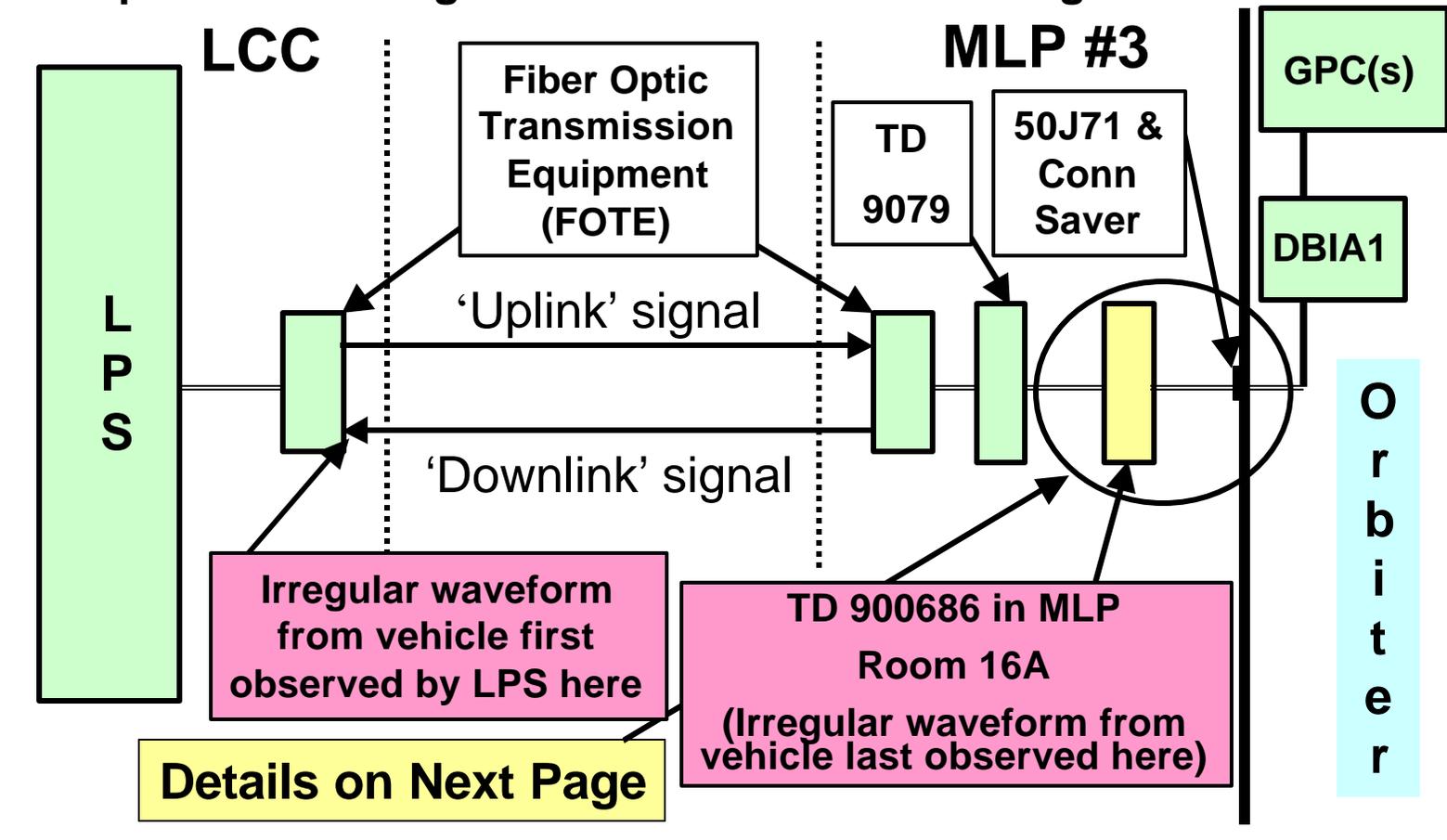
- Discussion
 - Auto-switchover was accompanied by 2 “LDB-1 Interrogate without Data Initial Timeouts” indicating that the GPC1 polled the ground for data and did not receive a reply
 - These I/O errors were annunciated by all four redundant set GPC’s, exonerating the GPC1 as a source of the anomaly
 - There was also no problem with the redundant set communicating with the SRB MDM’s on LDB-1, exonerating the portion of the circuit between the GPC1 and the GSE path to the Data Bus Isolation Amplifier 1 (DBIA-1)

**UNEXPLAINED ANOMALY
UNCOMMANDED SWITCHOVER
FROM LDB1 to LDB2****Presenter:****Greg Crews****Organization/Date:****Ground Ops/09-17-02**

- Discussion (Cont'd)
 - LPS data retrievals indicate that the LDB FEP did not receive the GPC poll command, and after 3 attempts the GPC forced an auto-switch to LDB-2
 - Oscilloscope traces of LDB-1 downlink signal at the FEP showed considerable distortion on the GPC poll signal evidence of corruption during the poll request

<p>UNEXPLAINED ANOMALY UNCOMMANDED SWITCHOVER FROM LDB1 to LDB2</p>	<p>Presenter: Greg Crews</p>
	<p>Organization/Date: Ground Ops/09-17-02</p>

Simplified Line Diagram for LPS to Vehicle Configuration



UNEXPLAINED ANOMALY UNCOMMANDED SWITCHOVER FROM LDB1 to LDB2

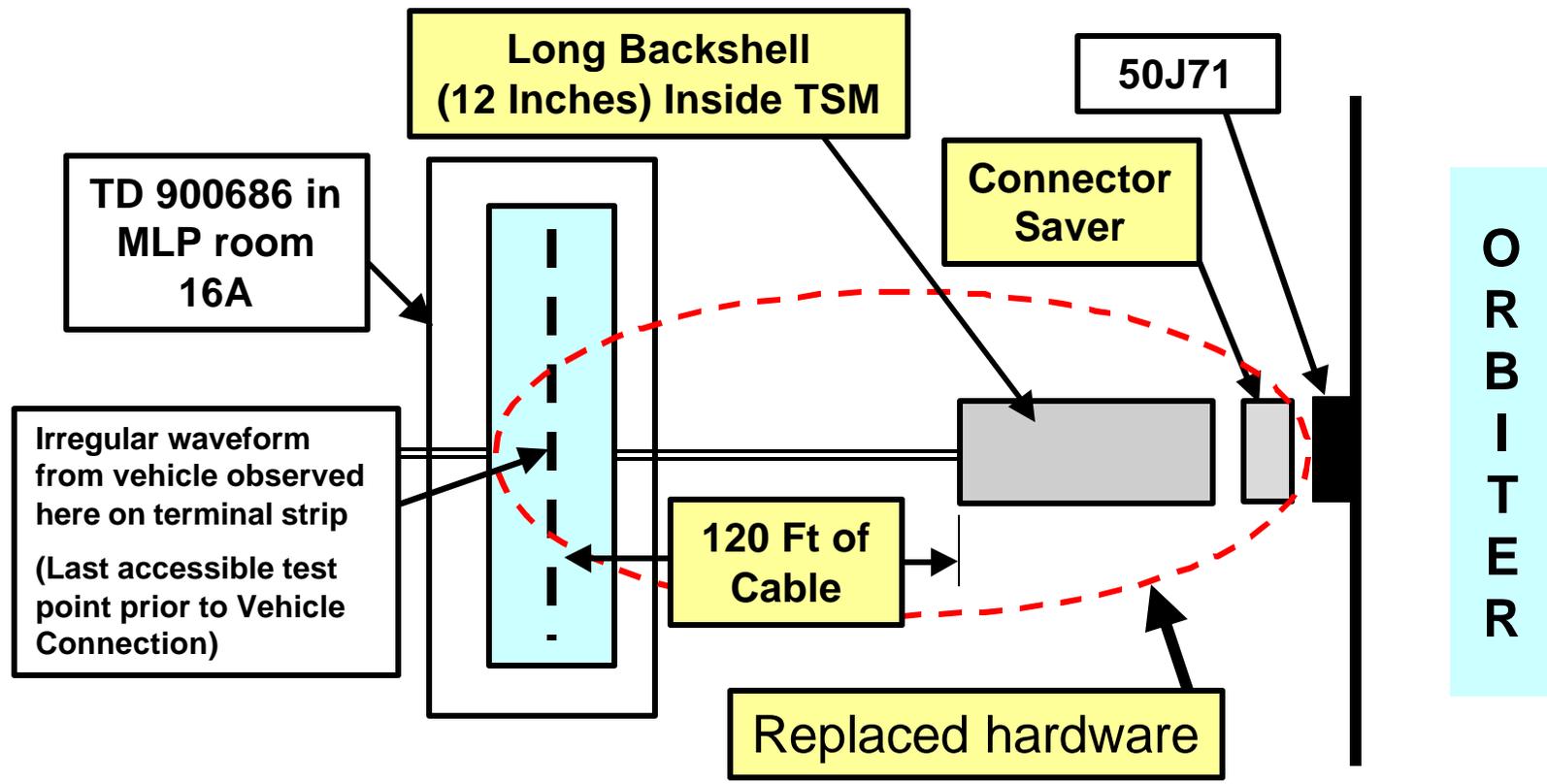
Presenter:

Greg Crews

Organization/Date:

Ground Ops/09-17-02

Detailed Line Diagram for LPS to Vehicle Configuration



**UNEXPLAINED ANOMALY
UNCOMMANDED SWITCHOVER
FROM LDB1 to LDB2****Presenter:****Greg Crews****Organization/Date:****Ground Ops/09-17-02**

- Actions Taken
 - Troubleshooting included monitoring of the LDB-1 signal
 - At the OLSA rack in MLP3 from the orbiter at the 9079 terminal distributor (TD) signal was distorted
 - On the 900686 TD on MLP3 (Last connection point prior to the T-0 umbilical) signal was distorted
 - LDB-1 signal was disconnected at 900686TD and a termination resistor was placed across the orbiter side of the data bus
 - Signal distortion remained present from the orbiter side, exonerating all ground transmission paths except the 50J71 T-0 Connector and associated 120 ft cable to the T-O

**UNEXPLAINED ANOMALY
UNCOMMANDED SWITCHOVER
FROM LDB1 to LDB2****Presenter:****Greg Crews****Organization/Date:****Ground Ops/09-17-02**

- Actions Taken (Cont'd)
 - While monitoring the signal at the 900686TD with an oscilloscope the distortion disappeared
 - There was no manipulation of the system at the time the distortion disappeared
 - No equipment was being manipulated
 - No Cables or connectors were being touched
 - Either on the ground or in the orbiter
 - Wire wiggling at nearby connectors was attempted but had no effect on the signal
 - The termination resistor was removed and LPS system reconnected
 - Nominal signal remained stable

**UNEXPLAINED ANOMALY
UNCOMMANDED SWITCHOVER
FROM LDB1 to LDB2****Presenter:****Greg Crews****Organization/Date:****Ground Ops/09-17-02**

- Actions Taken (Cont'd)
 - Several copper path failure modes were simulated at 900686TD, and none of these produced a signal distortion similar to the observed conditions
 - Tip-Ring Short – through the resistor
 - Tip-Shield Short – through the resistor
 - Ring-Shield Short – through the resistor
 - Open Tip and Open Ring
 - Polling was commanded through LDB-1 after reconfiguring 900686TD and no errors were noted
 - Since STS-110 Launch was imminent, a decision was made to replace the 6009W21P1 MLP T-0 120 ft Cable and GSE connector and the connector saver at the Vehicle I/F

**UNEXPLAINED ANOMALY
UNCOMMANDED SWITCHOVER
FROM LDB1 to LDB2****Presenter:****Greg Crews****Organization/Date:****Ground Ops/09-17-02**

- Actions Taken (Cont'd)
 - No further problems were noted with LDB-1 after the cable/connector replacement for the STS-110 launch
 - The document was transferred to STS-112 for post-flight troubleshooting
 - During STS-112, the orbiter wiring between LH T-0 connector 50J71 and DBIA-1 in Av Bay 4 was flexed while monitoring the polling between GPC1 and LPS with LDB-1 active
 - No dropouts or switchovers were observed
 - On Connector 50J71 at the T-0 the LDB-1 signal pins 'GG' and 'HH' were checked for adequate pin retention force
 - No anomalies were noted

**UNEXPLAINED ANOMALY
UNCOMMANDED SWITCHOVER
FROM LDB1 to LDB2****Presenter:****Greg Crews****Organization/Date:****Ground Ops/09-17-02**

- Actions Taken (Cont'd)
 - Normal usage of LDB1 as primary path for testing during the STS-112 flow has not recorded any anomalies to date
 - Approximately 4 months of usage without issue
- Failure Analysis
 - The MLP-3 connector 6009W21P1, cable assembly and connector saver were taken out of the MLP and offline for detailed troubleshooting post STS-110 Launch
 - Continuity and Dielectric (Meggar) testing revealed no electrical anomalies

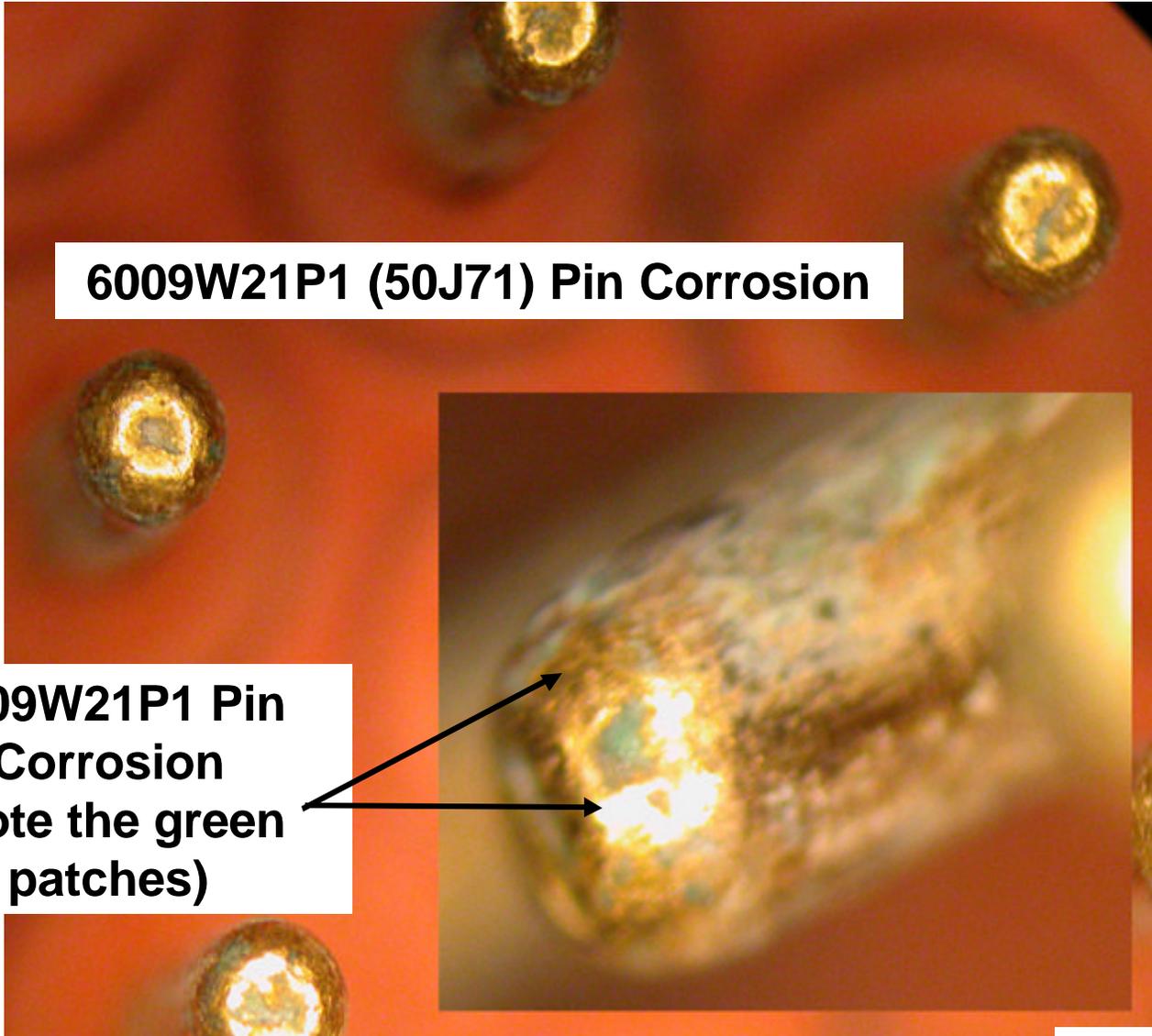
**UNEXPLAINED ANOMALY
UNCOMMANDED SWITCHOVER
FROM LDB1 to LDB2****Presenter:****Greg Crews****Organization/Date:****Ground Ops/09-17-02**

- Failure Analysis (Cont'd)
 - Additional testing was performed to determine the effect of an open or high resistance circuit in the transmission path on the quality or wave shape of a signal electrically similar to that of nominal LDB transmission
 - Testing indicated an open or high resistance would cause a similar distortion to what was observed in the MLP during STS-110
 - A more detailed visual inspection of the cable and connector was now performed offline from the TSM limited access
 - Identified the extent of pin corrosion
 - Identified what appeared to be a fine wire strand imbedded in the connector insulation face

MALFUNCTION LAB PHOTOS

6009W21P1 (50J71) Pin Corrosion

**6009W21P1 Pin
Corrosion
(Note the green
patches)**

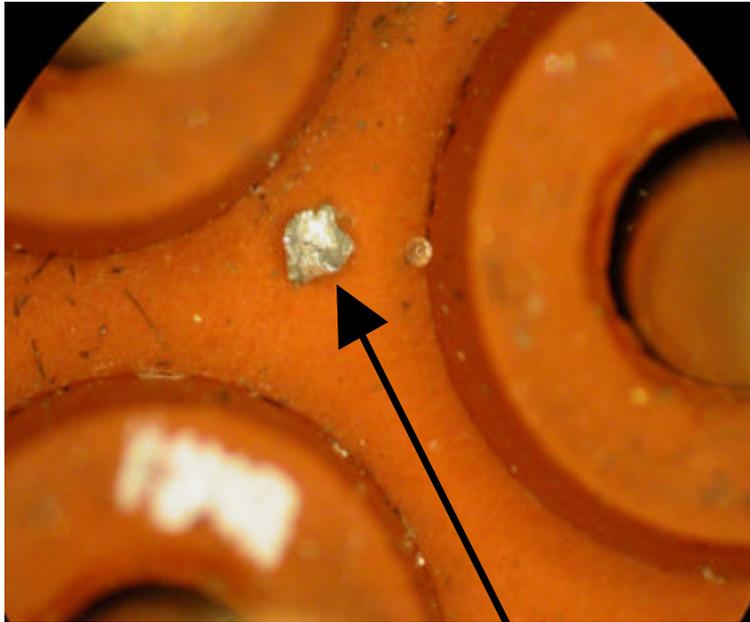


GO-BU-21

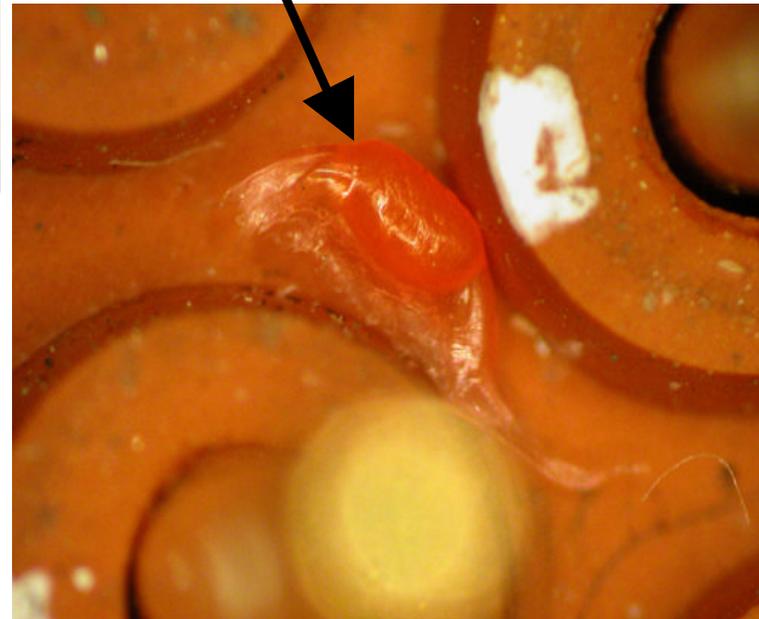
**UNEXPLAINED ANOMALY
UNCOMMANDED SWITCHOVER
FROM LDB1 to LDB2****Presenter:****Greg Crews****Organization/Date:****Ground Ops/09-17-02**

- Failure Analysis (Cont'd)
 - The connector saver, MLP3 connector 6009W21P1 and 2 ft of cable were cut off from the 120 ft cable and sent to the NASA MAB Lab for failure analysis
 - Preliminary Lab report shows extensive corrosion/contamination on the pins in this connector, including those carrying the LDB1 signal 'GG' & 'HH'
 - Major contaminants were composed of Al, Si, Cl, Ca, and 'Copper corrosion'
 - The fine gauge wire was also confirmed near but not touching pins 'GG' and 'HH' (See next few pages for photo's of debris)
 - The connector saver, connector, and cable stub were subjected to an Insulation Resistance Test and continuity testing with wire contamination present
 - Passed all testing conditions at (500V IR @ 100 Mohm)
 - Could not duplicate the exact LDB1 failure signature

MALFUNCTION LAB PHOTOS



Metallic
Debris/Reflector bead
in connector saver

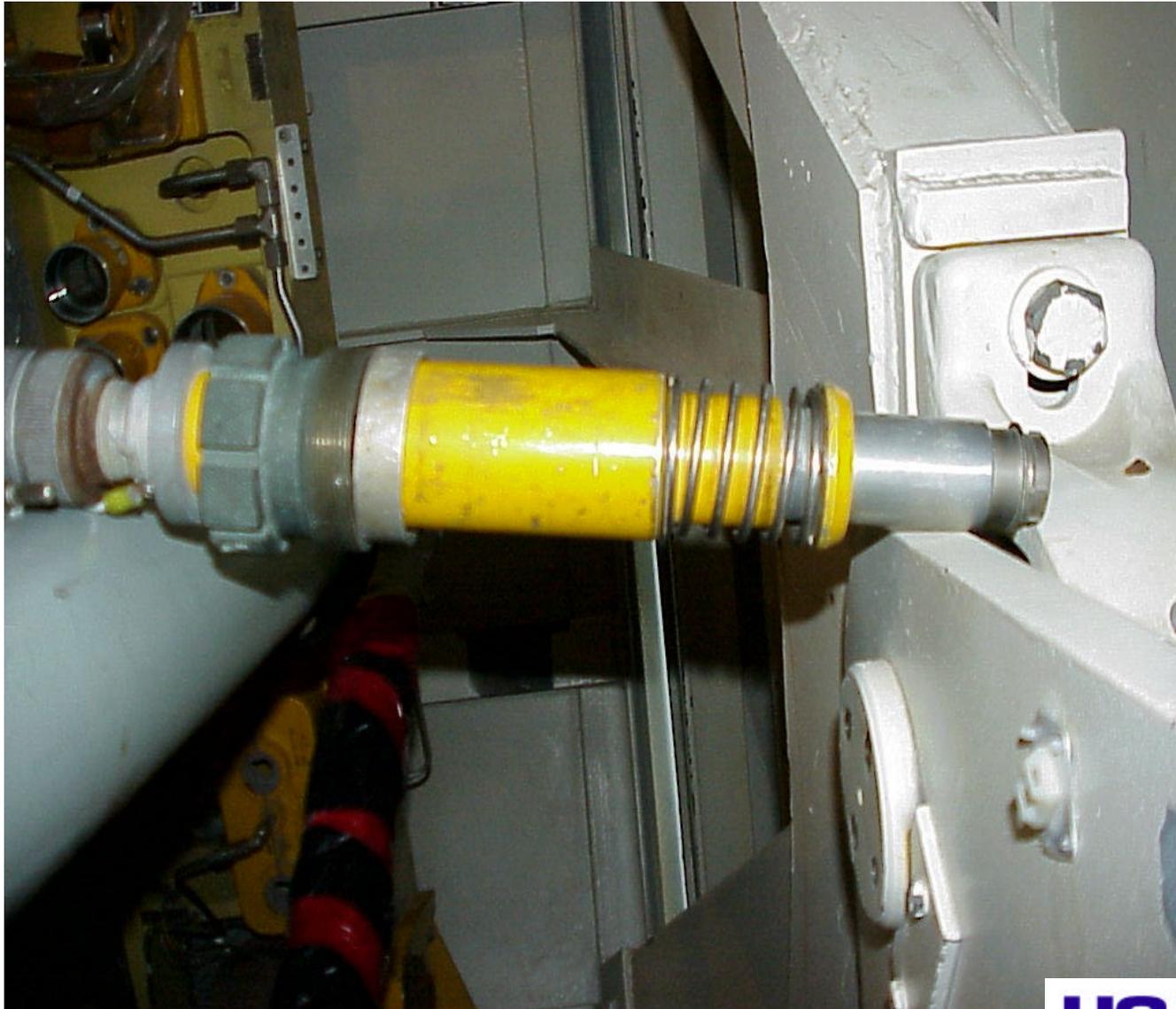


Connector Saver
– Inboard Side –
Plastic Debris

**UNEXPLAINED ANOMALY
UNCOMMANDED SWITCHOVER
FROM LDB1 to LDB2****Presenter:****Greg Crews****Organization/Date:****Ground Ops/09-17-02**

- Failure Analysis (Cont'd)
 - Could not duplicate the exact LDB1 failure signature
 - Pin corrosion was verified to be non-conductive
 - X-Ray results confirmed the nominal pin to socket contact length
 - 3mm for the 22 gauge wire connectors
 - Destructive testing and additional failure analysis are on-going
 - Further identify the nature of the corrosion
 - Identify a better cleaning solution/material and process for the future of these typical connections
 - Cleaning to date has been with IPA applied by brush

T-0 CABLE ASSEMBLY



GO-BU-25

T-0 CABLE ASSEMBLY



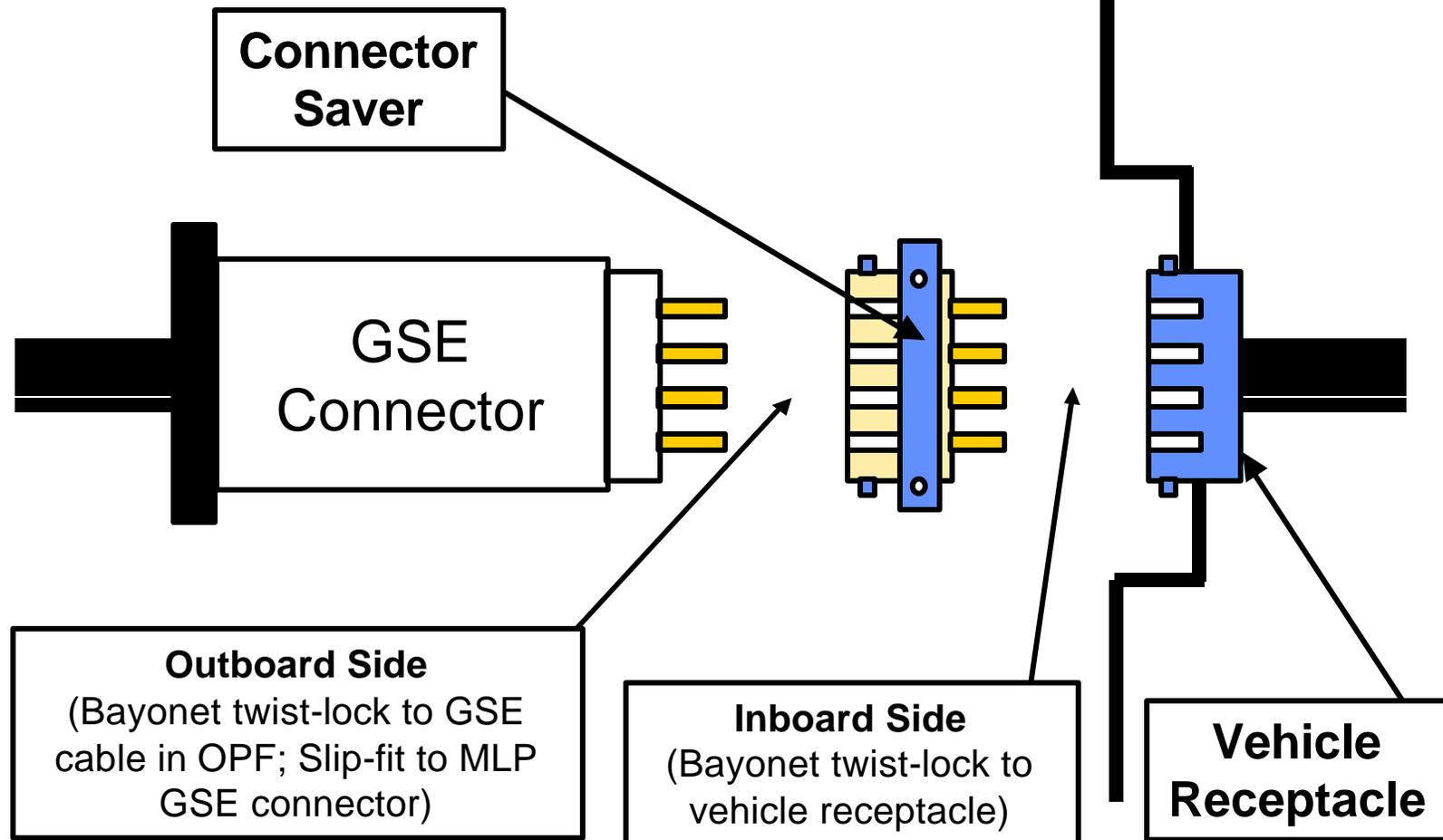
Inside TSM- looking toward vehicle
GO-BU-26

**UNEXPLAINED ANOMALY
UNCOMMANDED SWITCHOVER
FROM LDB1 to LDB2****Presenter:****Greg Crews****Organization/Date:****Ground Ops/09-17-02**

- Possible Causes
 - An Intermittent copper path problem in the wiring between the 900686 TD and GSE Connector 6009W21P1
 - An intermittent in the onboard data bus wiring between the T-0 receptacle 50J71 and DBIA-1 in Av Bay 4
 - An intermittent electrical problem in the Data Bus Coupler (DBC) linking LDB-1 to DBIA-1
 - An intermittent electrical problem in the portion of the DBIA-1 that handles the LDB communication between LPS and the onboard GPC's
 - An Intermittent copper path problem between the outboard sockets on the vehicle connector 50J71 and the pins on the Connector Saver
 - An Intermittent copper path problem between the outboard sockets on the Connector Saver and the pins on GSE Connector 6009W21P1

T-0 CONNECTOR PINS/SOCKETS ANOMALY – PROBABLE CAUSES:

Orbiter Aft



GO-BU-28

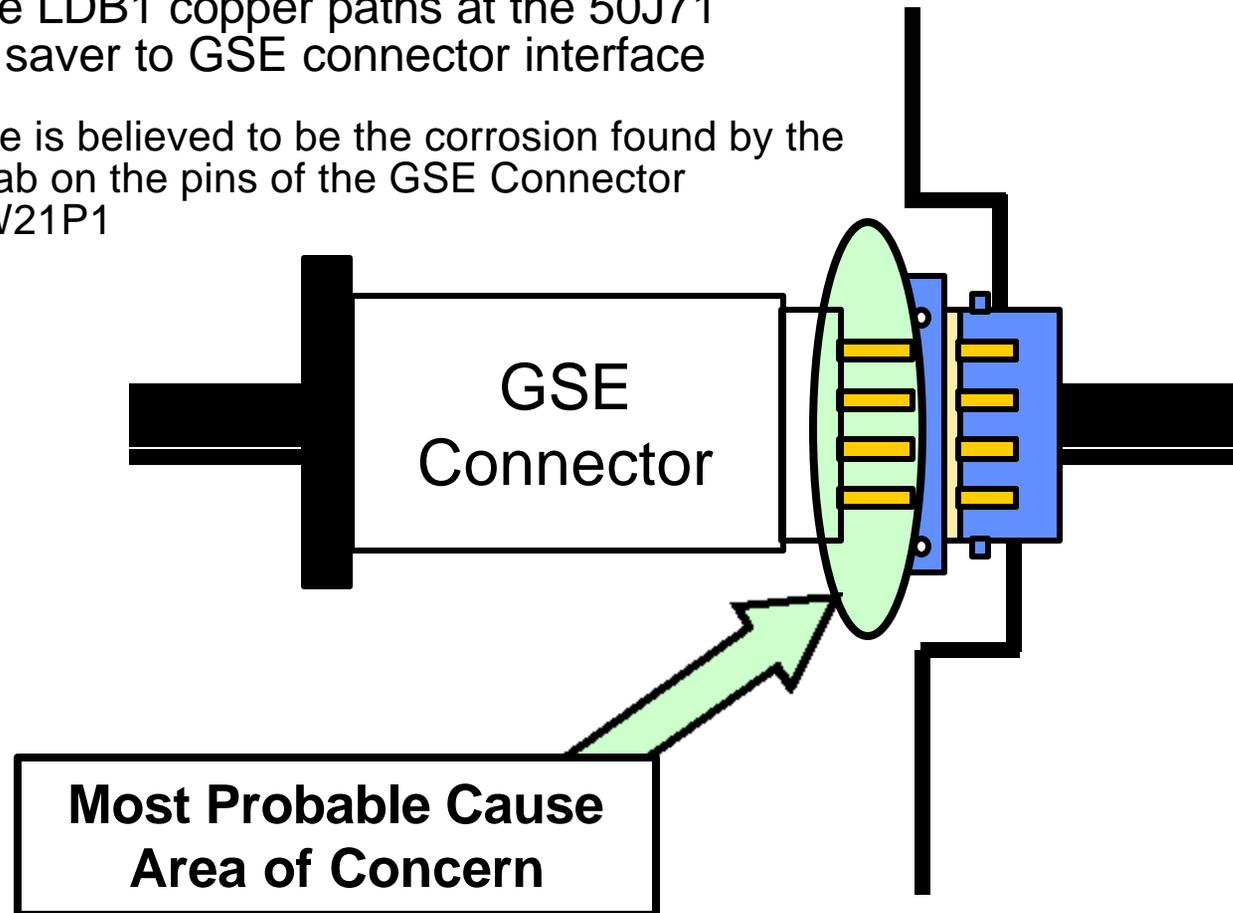
T-0 CONNECTOR PINS/SOCKETS ANOMALY

- Most Probable Cause

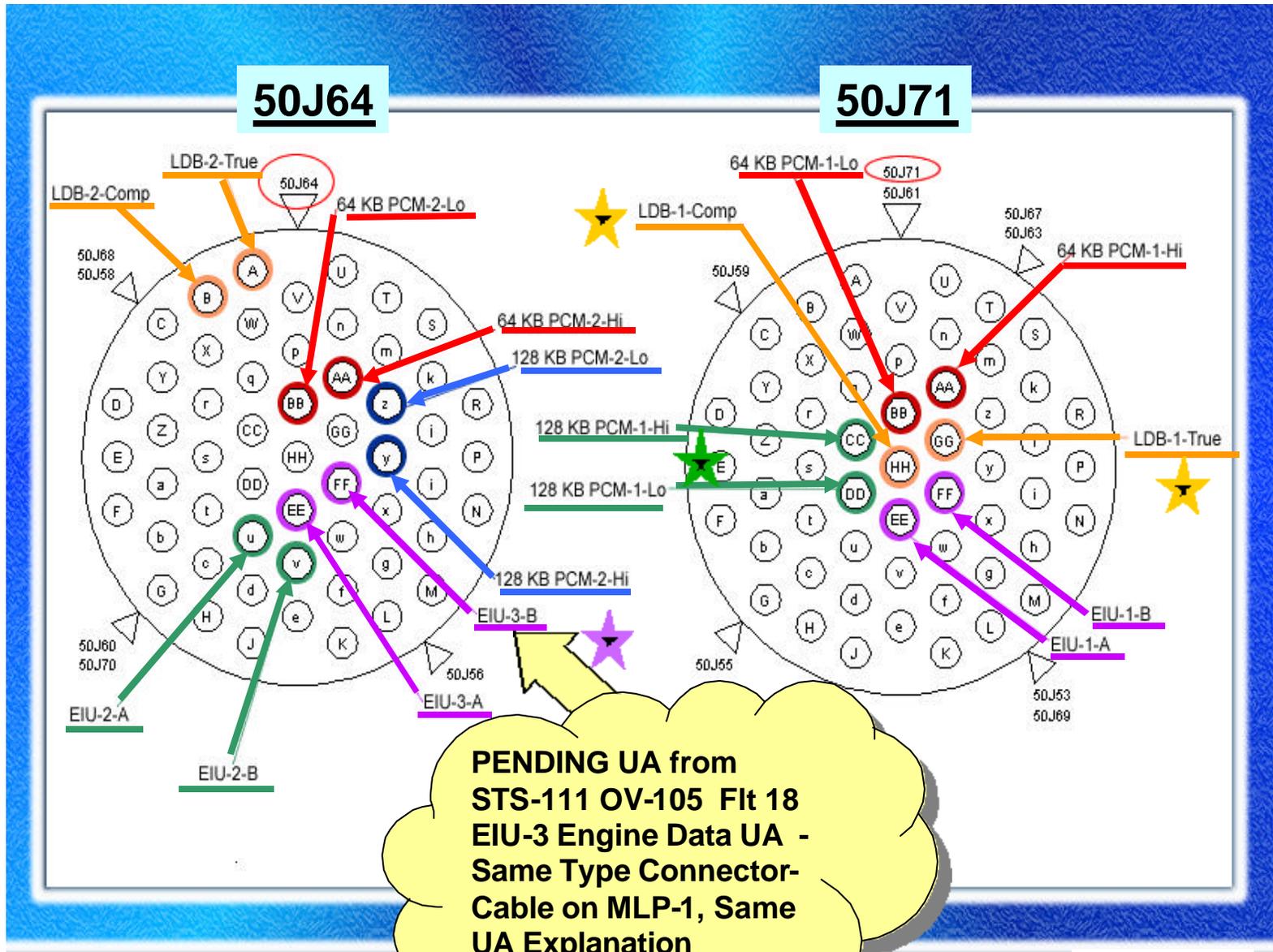
- An intermittent open or high resistance in one or more of the LDB1 copper paths at the 50J71 connector saver to GSE connector interface

- Cause is believed to be the corrosion found by the MAB lab on the pins of the GSE Connector 6009W21P1

Orbiter Aft



50J64/71 PIN LAYOUT



**PENDING UA from
STS-111 OV-105 Flt 18
EIU-3 Engine Data UA -
Same Type Connector-
Cable on MLP-1, Same
UA Explanation**

**UNEXPLAINED ANOMALY
UNCOMMANDED SWITCHOVER
FROM LDB1 to LDB2****Presenter:****Greg Crews****Organization/Date:****Ground Ops/09-17-02**

- Flight Rationale
 - Problem affects Ground Processing only and has no effect on flight operations
 - LDB2 can be used for ground safing in the event that LDB 1 Fails again
 - LCC requires 2 of 2 LDB's for Tanking
 - Loss during Tanking would require a scrub turnaround
 - The hardware associated with the most probable cause (MLP Cable Assembly - 6009W21P1 and Connector Saver) have been replaced
 - Similar hardware for the RH T-0, Cable, Connector, and Connector Saver, for 50J64 have also been replaced
- Risk Assessment
 - No risk to Flight and Crew's safety or Mission success

FUEL CELL RUNTIME

Presenter:

Greg Crews

Organization/Date:

Ground Ops/09-17-02

- Fuel Cell (FC) Runtime Contingency
 - Present Runtime Hours
 - FC1 s/n 106 1601
 - FC2 s/n 118 0
 - FC3 s/n 120 1268
 - Planned Runtime Usage - 366 hours
 - 11 day mission + 2 weather contingency days + 30 hours FC start/landing
 - Available Contingency Runtime
 - FC1 633 hours
 - FC2 2234 hours
 - FC3 966 hours